

Appln. No. 10/642,333  
Amdt. dated August 30, 2005  
Reply to Office Action of June 24, 2005

**Amendments to the Specification:**

**Please amend page 1, line 14 to page 2, line 8:**

The fast pyrolytic production of liquids from biomass has progressed with the development of improved techniques. Such liquids are termed BioOil. BioOil is a generic term known in the industry as are and is produced by converting organic residues such as forest and agricultural wastes in a fast pyrolysis process. BioOil is thermally unstable, being prone to polymerization/caramelization and thermal cracking when exposed to elevated temperatures for prolonged periods of time. These products are in the form of gasses, aerosols, vapours and char. In this process, the char is first removed with cyclone separators. Because of the thermally unstable nature of the BioOil product normal surface condensers are inefficient and subject to extreme fouling. As well, the BioOil vapour is subject to chemical degradation. Consequently most processes follow the cyclone separators with a quench tower for rapid cooling, condensation and coalescence of the BioOil. Nevertheless, there remains a significant amount of stable aerosols in the effluent gas stream. Filtration or electrostatic precipitations are usually employed to clean the gas stream further. These systems are not ideal as they suffer variously from high-pressure drops, expensive maintenance or high capital cost. This is especially so for biomass feedstocks rich in resins and waxes, such as sugar cane bagasse and bark rich wood residues.

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**Please amend page 3, line 22 to page 4, line 11**

According to the invention there is provided a method of continuously capturing BioOil and its constituents from a gas stream produced in a fast pyrolysis/thermolysis process, in a usable liquid form so as to produce a non-condensable gas free of fouling contaminants. The method includes separating BioOil and its constituents from a gas stream using hot inertial separation to maintain the temperature of said BioOil such that its sticky and/or thick constituents at a temperature below its point of rapid degradation and above a point at which its viscosity is low enough to avoid inefficient operation of the separation equipment. Next the gas velocity is reduced to a temperature sufficiently low to allow droplets in the gas stream to settle out in a settling section but with a gas temperature high enough so that a viscosity of said droplets remains low enough to avoid inefficient operation of the separation equipment. Finally, a condensing step is carried out to condense the vapour in the gas stream.

**Please amend page 6, lines 1- 23**

capturing BioOil and its constituents from a gas stream produced in a fast pyrolysis/thermolysis process, in a usable liquid form so as to produce a non-condensable gas free of fouling contaminants. The apparatus includes a separator operative to separate BioOil and its constituents from a gas stream and to maintain the temperature of the BioOil and its constituents at a temperature such that its sticky and/or thick constituents at a temperature below its point of rapid degradation and above a point at which its viscosity is low enough to avoid inefficient operation of the separation equipment and a gas retention apparatus ~~operative to reduce gas velocity~~

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wherein the gas is at with a temperature sufficiently low to allow droplets in the gas stream to settle out but with a temperature high enough so that a viscosity of said the droplets remains low enough to avoid inefficient operation of the separation equipment.

The separator may be a first cyclone separator followed by a meandering pipe coupled to an outlet of the first cyclone separator operative to collect BioOil droplets, wax, resin, char and aerosol in a sub-micron size and greater. A BioOil, wax and char collection tank may be coupled to a liquid outlet of the first cyclone separator.

The gas retention apparatus may be a gas tank ~~which reduces gas velocity of the gas stream~~. A condensation section, operating in a temperature range of 5 to 20 degrees C., may be coupled to an outlet of gas tank, the condensation section operative to separate out and collect condensable materials from the gas stream.